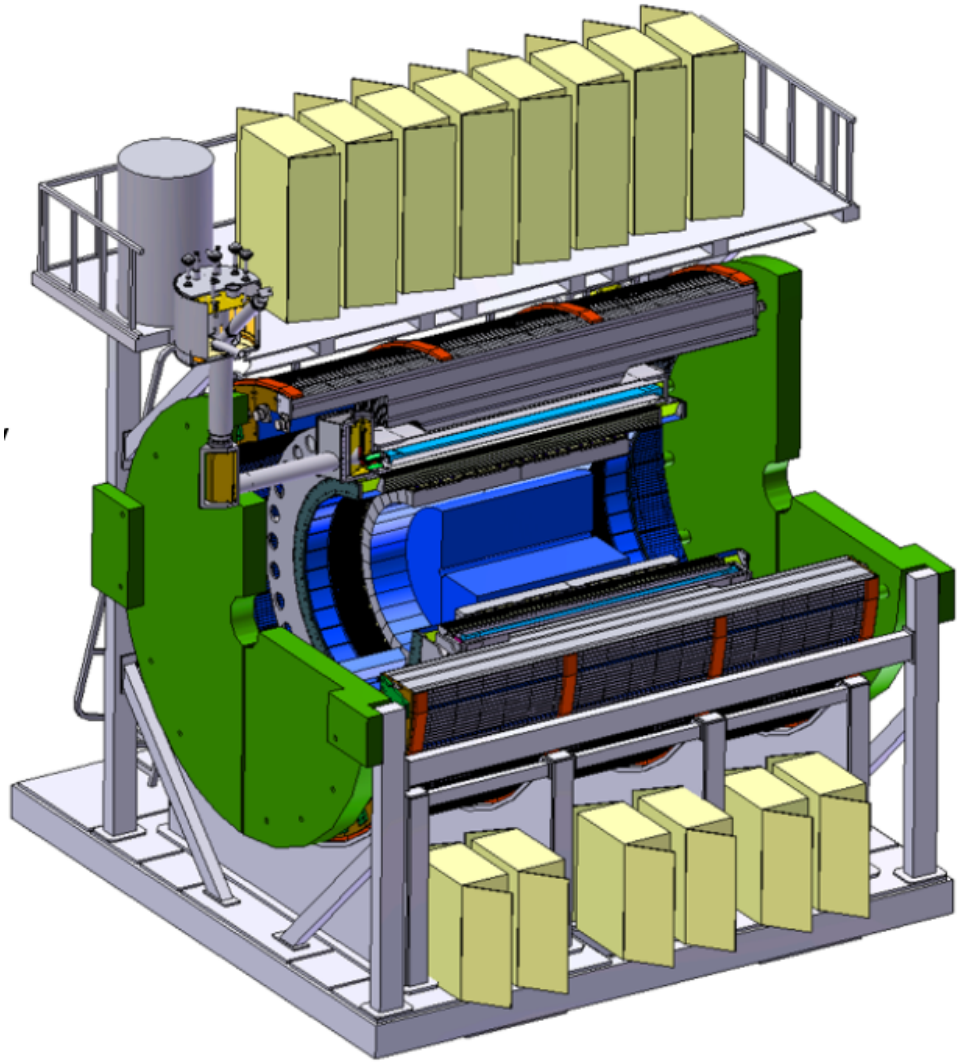
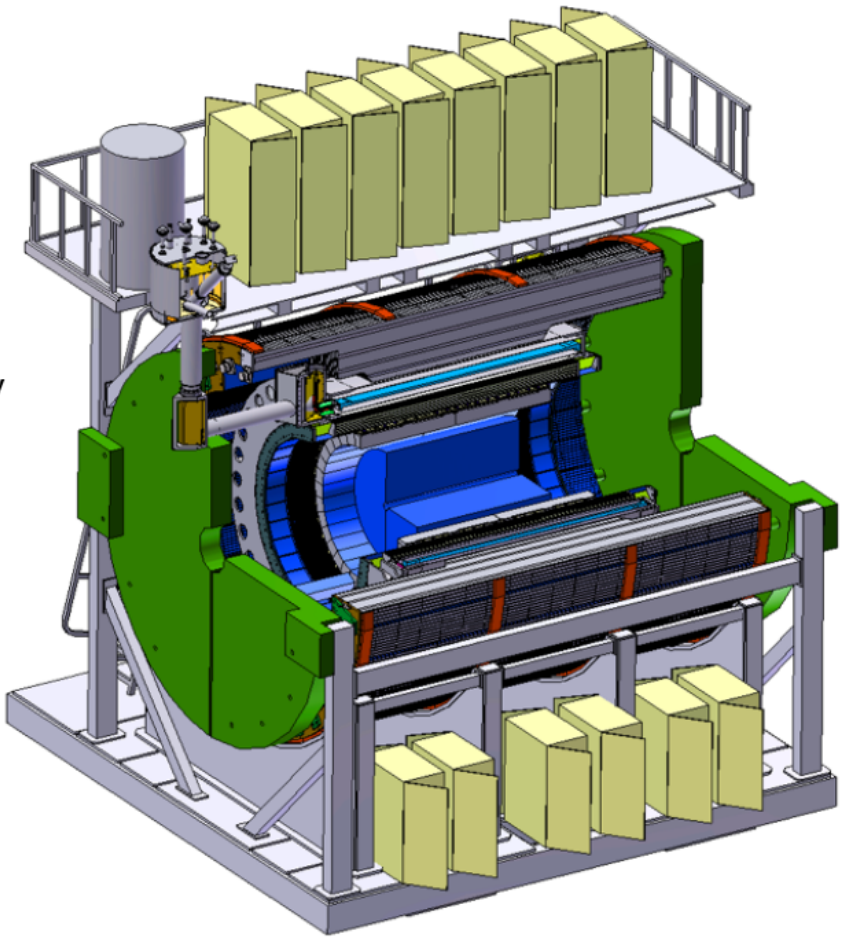
The Proposed sPHENIX Project



What is sPHENIX?

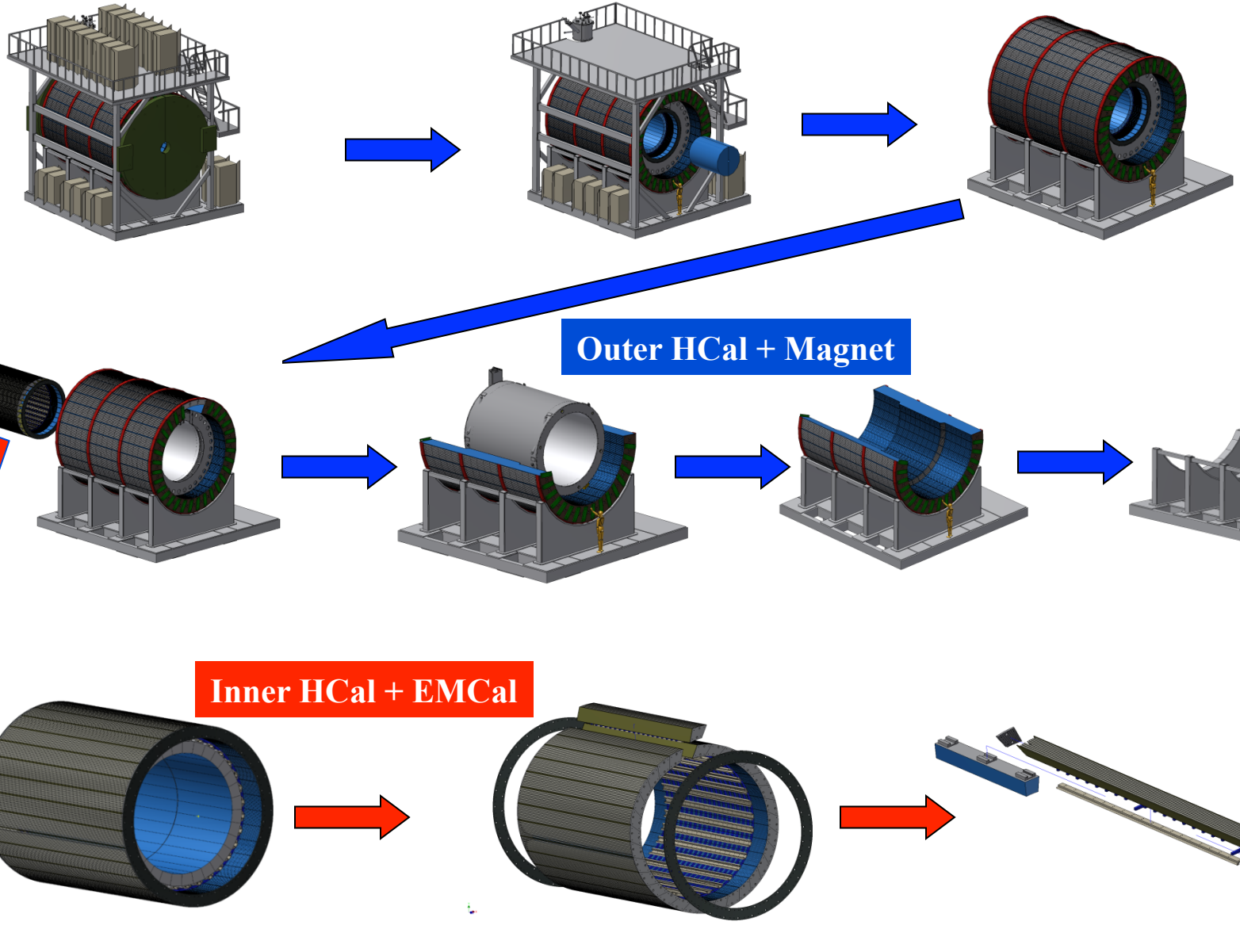
- **sPHENIX is a major upgrade to the PHENIX detector. It is a large-acceptance, high-rate detector for Heavy Ion physics that repurposes >$10M in existing PHENIX equipment, infrastructure and support facilities**
- **The detector is optimized to measure jet and heavy quark physics by incorporating a Tracker, full EM and Hadronic calorimeter coverage at $|\eta| < 1.1$, and a 1.5 T solenoidal magnetic field.**
- **It will utilize most of the infrastructure already existing in the PHENIX detector complex and the BaBar SC-magnet**
- **A bottoms-up project plan has sPHENIX assembled, commissioned and ready to take data in January 2022.**

sPHENIX Reference Design



- Uniform acceptance $-1.1<\eta<1.1$ and $0<\varphi<2\pi$
- Superconducting solenoid enabling high resolution tracking
- Hadronic calorimeter doubling as flux return
- Compact electromagnetic calorimeter to allowing fine segmentation at a small radius
- Solid state photodetectors that work in a magnetic field, have low cost, do not require high voltage
- Common readout electronics in the calorimeters
- High rate 15 kHz in AA allows for large unbiased MB data sample
- Utilization of existing 1008 Infrastructure
- Compact TPC + MAPS-vertex +Intermediate Si Strip Tracking layers for Tracker

sPHENIX Deconstructed

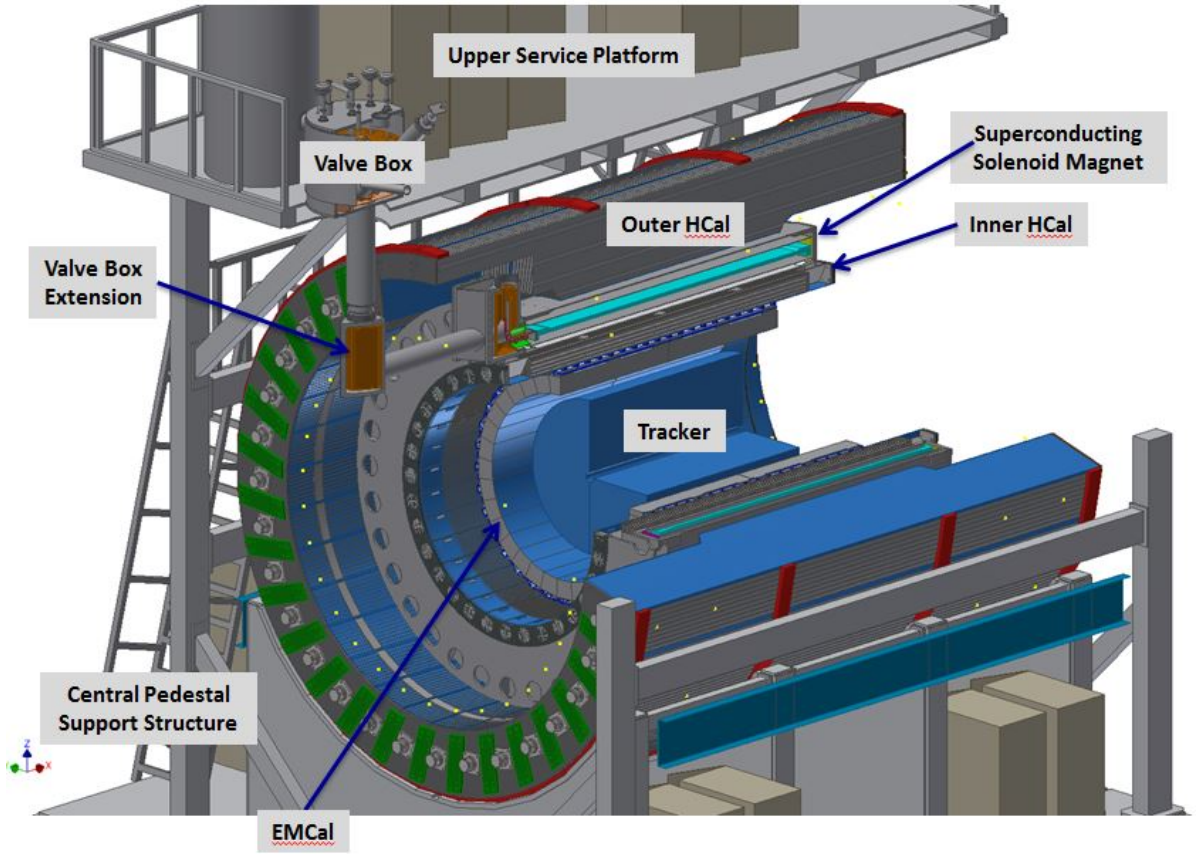


Proposed sPHENIX Project Scope

sPHENIX is a MIE project costing 30-35M AY$

sPHENIX MIE Project scope:
Project Management
Tracker
EMCal
HCal
Calorimeter Electronics
DAQ/Trigger

Facility support activities:
SC- Magnet
Infrastructure
Installation/Integration



sPHENIX Calendar – Many Reviews

• sPHENIX Proposal submitted to DOE	Fall 2012
• **DOE Science Review 1**	**July 2014**
• Revised Proposal	Nov 2014
• **Internal Rev of SC-magnet**	**Dec 2014**
• **Internal Rev of Decommissioning and Installation**	**Jan 2015**
• **Internal Rev of HCal**	**Feb 2015**
• BaBar magnet arrives at BNL	Feb 2015
• **Internal Rev of Calorimeter Electronics**	**Mar 2015**
• **DOE Science Review 2**	**April 2015**
• Org Meeting to form new sPHENIX collaboration	Jun 2015
• **Internal Rev of EMCal**	**Aug 2015**
• **BNL-charged Cost and Schedule Review**	**Nov 2015**
• Formation of new collaboration	Dec 2015
• Election of Spokespersons/Executive Council	Jan-Apr 2016
• **Internal Rev of TPC/Tracker**	**Jun 2016**
• **Internal Review of MAPs-vertex/Tracker**	**Jul 2016**
• **BNL-Charged Tracker review**	**Sept 2016**

In addition there have been numerous simulations workshops & topical reviews approximately 490 sPHENIX meetings archived on Indico

Projected Future sPHENIX Schedule

CD-0	**Fall 2016**
Director's Cost and Schedule Review	**Nov-Dec 2016**
Test Beam at FNAL(2nd round prototyping)	**Jan 2017**
OPA-CD-1/CD-3a Review	**May-Jun 2017**
CD-1/CD-3a authorization	**Nov-Dec 2017**
All Preproduction R&D and Design complete	**May-Jun 2018**
OPA- CD-2/CD-3b review	**May-Jun 2018**
CD-2/CD-3b authorization	**Jul-Aug 2018**
sPHENIX Installed, cabled, ready to commission	**Apr 2021**
First RHIC beam for sPHENIX	**Jan 2022**

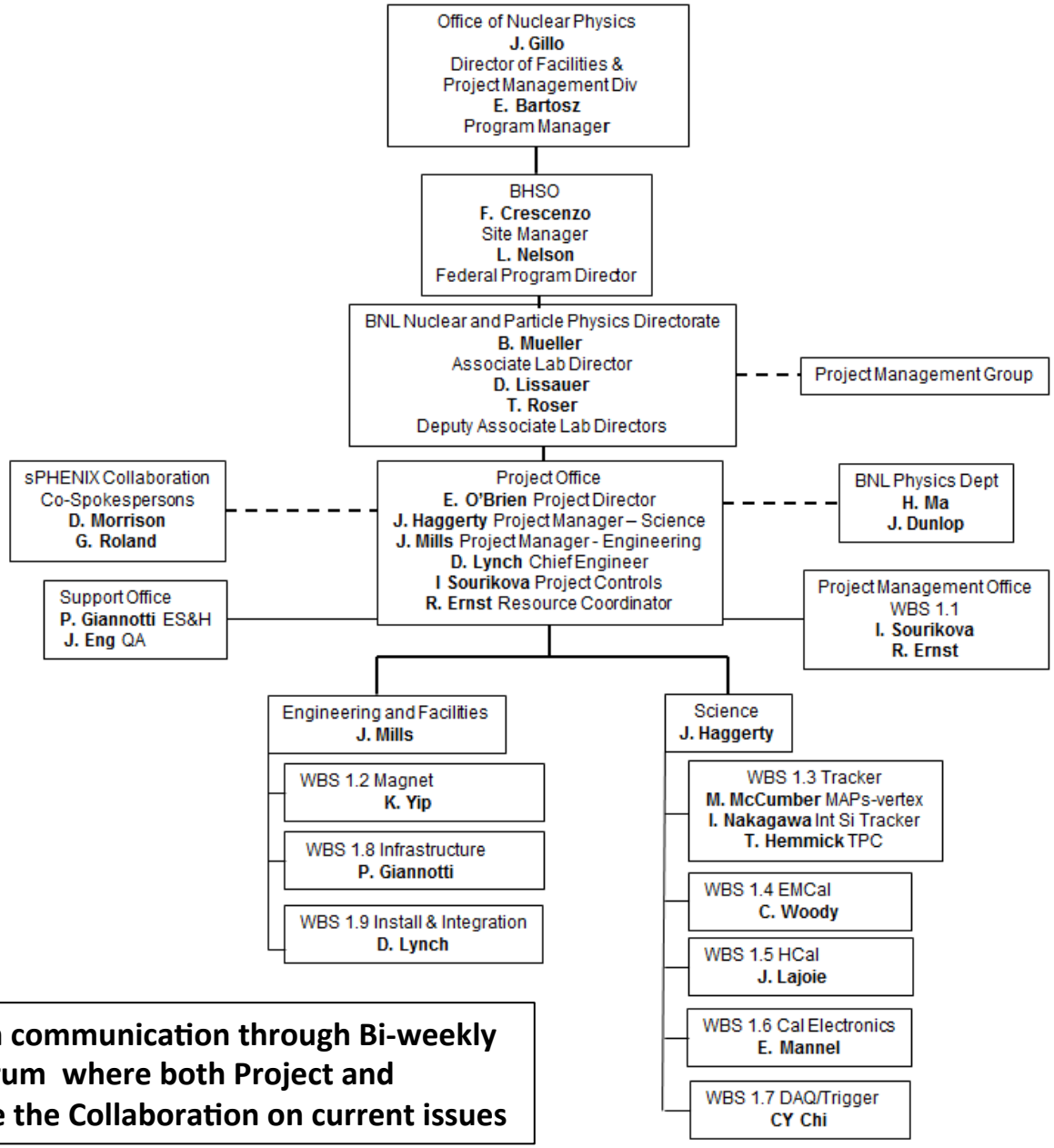
The Resource-loaded Schedule contains 8.5 months of float to Jan 2022

Status of sPHENIX

- Positive outcome for the Director's Cost & Schedule review of sPHENIX, Nov 2015
  - **Implemented recommendations to carry 40% contingency at this early stage of project**
  - **Revised schedule to add 8.5 months of project float. New physics start date Jan 2022**
  - **Added Tracker subsystem to Project. Had previously been planned as international contribution.**
  - **Scrubbed the budget numbers**
- Presented sPHENIX funding plan to DOE-ONP Budget Briefing , Feb 2016
- Low power cold test of SC-Magnet in Bldg 912: joint SMD, CAD, Phys effort, Mar 2016
  - **Preparations underway for a full field test in early CY 2017**
- Beam test at FNAL of proposed calorimeter technologies considered for sPHENIX, Apr 2016. **Both EMCal and HCal performance specs met**.
- sPHENIX scoping and budget exercise, Apr-May 2016
- Received Permission from DOE-ONP to remove existing PHENIX detector after RHIC Run-16 in preparation for a major upgrade, May 2016
- End of RHIC Run-16, PHENIX detector removal has started, Jul 2016

Anticipate CD-0 in Fall 2016

Project Organization



Project-Collaboration communication through Bi-weekly General Meeting. Forum where both Project and Spokespeople update the Collaboration on current issues

Support for Progress on sPHENIX Hardware

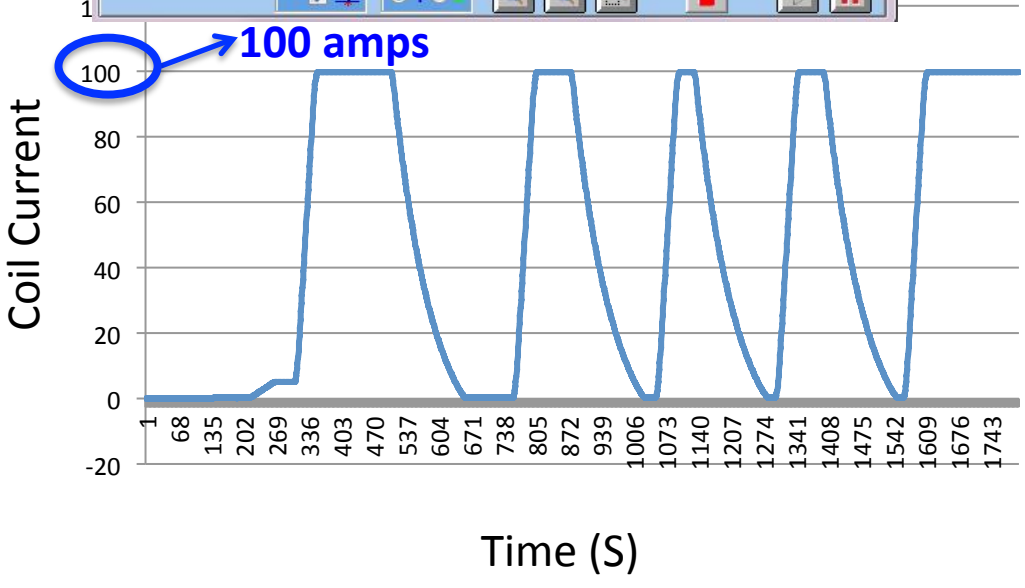
Both BNL and outside support have been invaluable in support of generic R&D and feasibility studies:

- BNL has provided funds for the relocation and testing of the BaBar SC-magnet
- BNL has also provided LDRD and Program Development funds to support generic R&D on Calorimetry and Tracker(TPC) technologies of potential use for sPHENIX.
- The EMCal and TPC design have both benefitted for technology developments made possible by EIC generic R&D
- The MAPS-vertex has received significant LDRD support from LANL
- Japanese funds are being used to support R&D of the Intermediate Tracker which would be a 4 layer Si strip detector.
  - Expect commitment letter from RIKEN on the Intermediate Tracker being an institutional contribution to the sPHENIX experiment.

Low-Field Test of sPHENIX Magnet - Mar 2016

The sPHENIX Magnet was successfully cooled to 4K and ramped to 100A. The field measure was exactly as expected for this current. Thanks to many techs, engineers and scientists from SMD, CAD and Physics that worked for months to make this happen.

Magnet cold test results

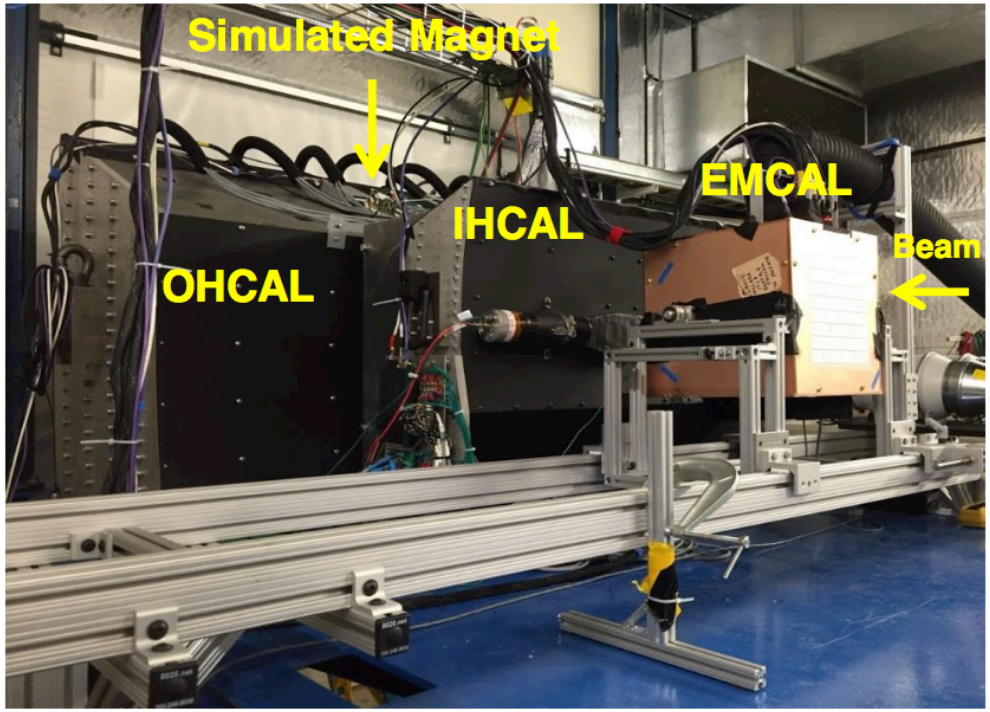


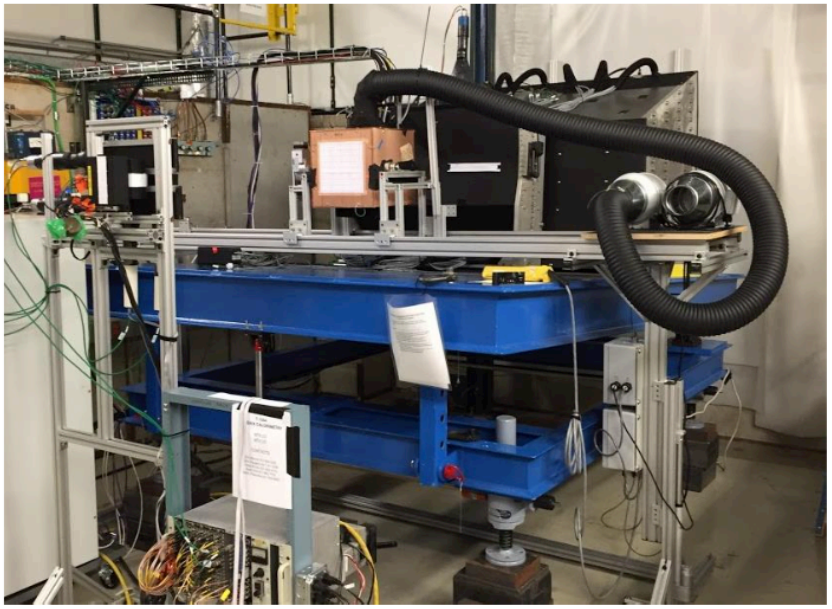
Ramp rate 2.5 A/S

At 4.4 º K we put 100 amps on the magnet coil and the solenoid field generated was 256 G, as expected. The coil was superconducting.

Prototyping Various Calorimeter Technologies Using a Test Beam Set Up at FNAL

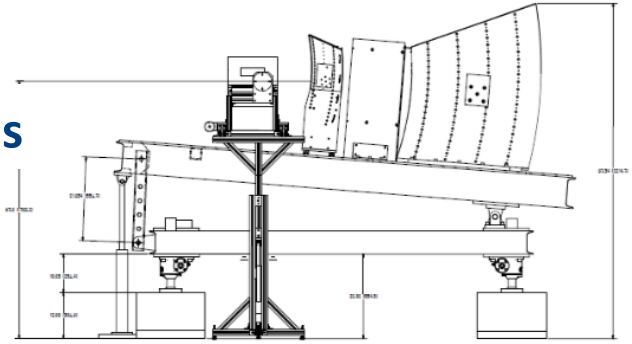
All three prototype calorimeters in the beam line at Fermilab





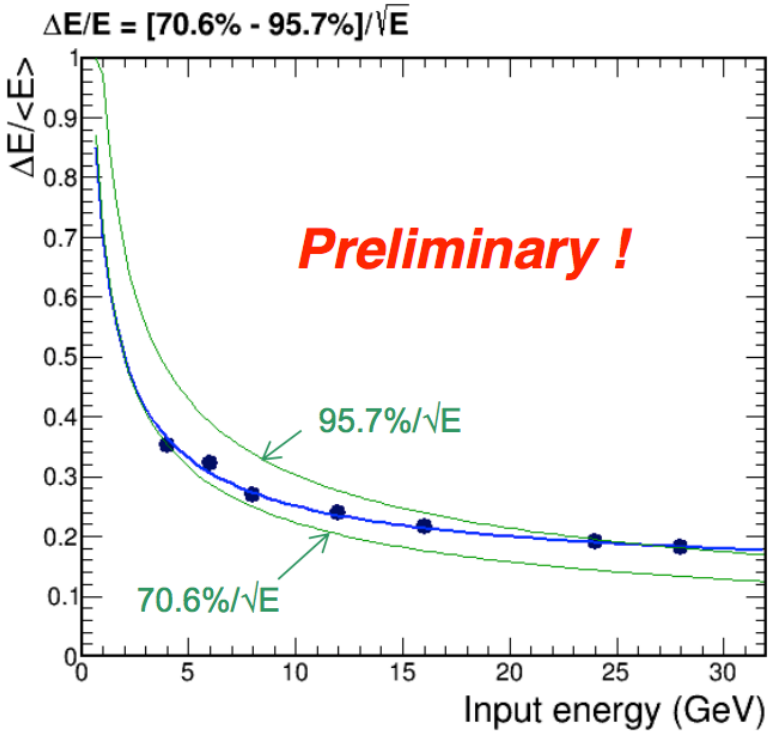
Work supported by BNL Program Dev & LDRD funds

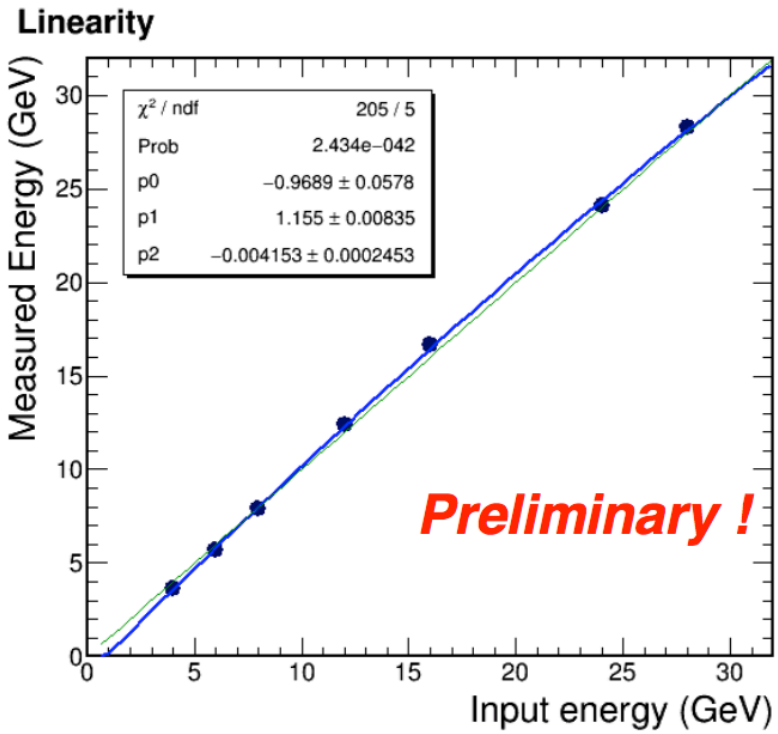
Measured at three tilt angle positions (0, ± 4.5°)



EMCal+HCal Resolution & Linearity

Results shown by Craig Woody at CALOR conference in May





- Combined energy resolution meets our design goal of < 100%/√E
- Two component fit gives **68%/√E ⊕ 12.9%** **Hadronic resolution spec met**
- Constant term is first pass on tower to tower calibration and will certainly improve with further analysis

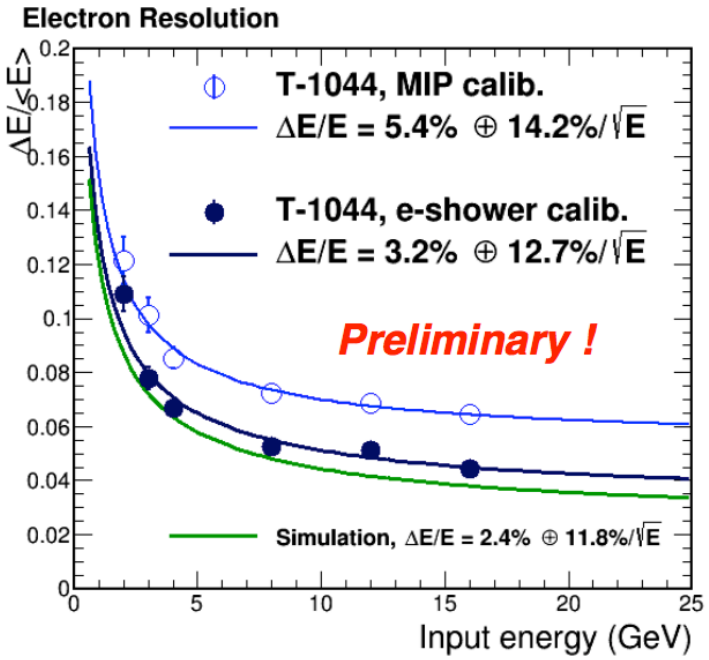
sPHENIX EMCal Resolution and Linearity

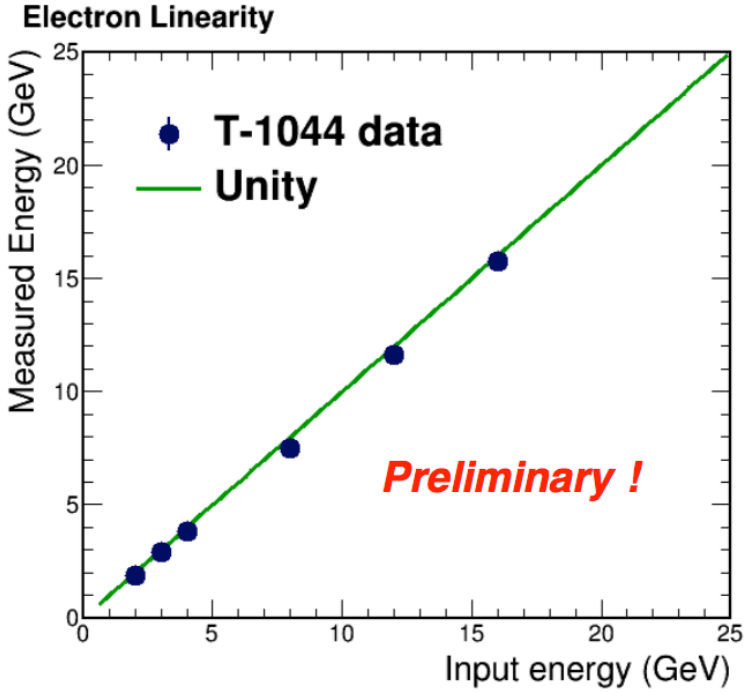
Results shown by Craig Woody at CALOR conference in May

Electrons selected using beam Cherenkovs

(Also require hodoscope hit + no veto hit)

Beam momentum spread of ~ 3% ***not*** unfolded





EM Resolution spec met after correction for beam momentum spread

sPHENIX Test Beam Summary

- **Analysis for April 2016 test beam data show that the EMCal and HCal designs will meet the performance requirements of sPHENIX at low eta.**
  - Performance of the detector geometry at eta = 0, scintillator tiles, SiPMs, preamps, 1-D projective EMCal towers all look good to first order
  - Various details like the LED implementation, temperature response, etc will be improved and optimized between now and next test beam.

- **Next test beam (Jan 2017 @ FNAL) will be for high eta response, digitizer electronics and the 2x2 EMCal modules**

- **Successful beam tests will allow us to retire technical risks and reduce contingency in preparation for a CD-1 review**

PHENIX Removal and Repurposing Status

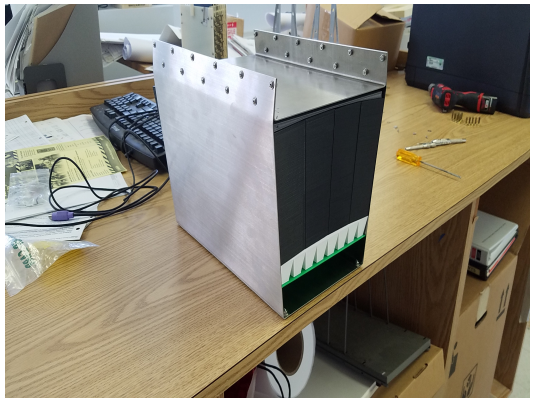
- We have received permission from DOE-ONP to begin removing excess equipment from the PHENIX Detector, repurposing that equipment as appropriate for sPHENIX and preparing the Bldg 1008 complex for a major upgrade to the PHENIX- sPHENIX. **R&R began in early July**.
- A plan, schedule and budget exists for the removal and repurposing activities and has been presented to both DOE-ONP and BHSO
- We've provided DOE-ONP with an initial equipment disposition plan for the PHENIX detector. They have asked that we continue to keep them informed.
- BNL Environmental Protection Division has reviewed and approved our Environmental Evaluation and Notification Form for PHENIX Removal and sPHENIX installation
- We've met with BNL Property Management informed them of our equipment retirement plan and agreed to a general procedure for PHENIX equipment disposition and equipment retirement. PPM has begun retiring key barcodes that allow us to begin to disposition the PHENIX equipment.

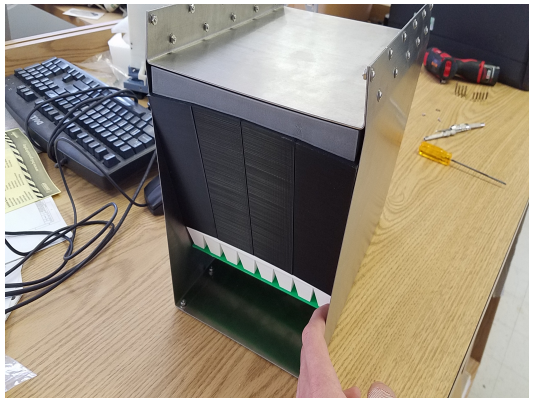
sPHENIX Summary

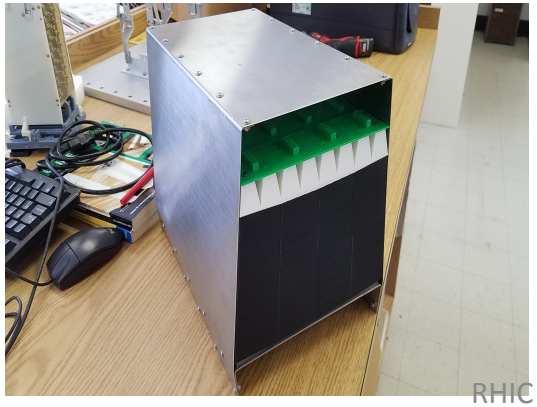
- Former BaBar SC-magnet moved to BNL for use in sPHENIX. We have successfully completed warm testing and a cold low-power test. A full field cold test is scheduled for early 2017.
- Good progress in establishing viability of detector technologies proposed for sPHENIX through generic R&D, LDRD and PD activities.
  - **HCal: "Tilted-plate" calorimeter, SiPMs, FEE**
  - **EMCal: Scin-fiber/W powder EMCal, SiPMs, FEE**
  - **TPC: Prototype design, field cage construction and GEM module readout**
- There remain a few open technical questions (typical for pre CD-0):
  - Tracker technology options have been significantly narrowed
    - **Baseline Tracker is Compact TPC + MAPs-vertex + Intermediate Si Strip Tracker**
    - **4-layer Si Strip Intermediate Tracker will be a contribution to sPHENIX from RIKEN.**
  - Mass production techniques for EMCal 2x2 towers are being worked on.
    - **Need to make ~6100 2x2 towers**
- Resource-loaded bottoms-up cost estimate exists. Revised to incorporate recommendations of Cost and Schedule review, and additional BNL and DOE guidance.
  - **Updated cost information from vendors will be updated by mid-Fall 2016**
- PHENIX removal and repurposing has started. Slightly ahead of schedule.
  - **Documentation in place for Safety, Property, Work Planning documentation, etc.**
  - **Being closely followed by BNL NPP, BNL Directorate and BHSO**

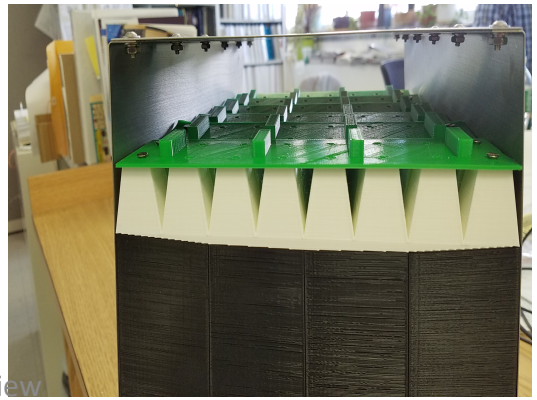
Back Up

3D Printed EMCal Prototype ¼ Sector

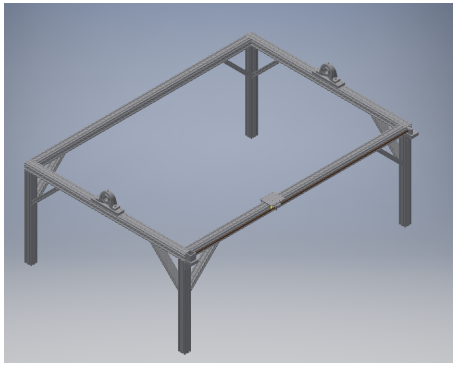


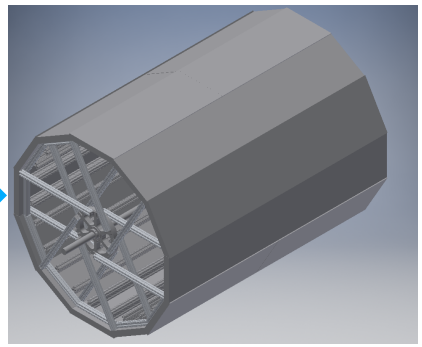




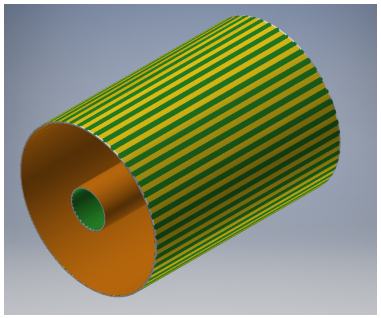


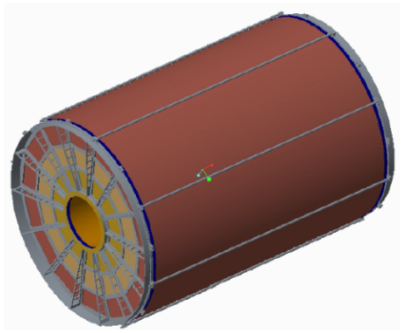
How to build a TPC Field Cage





Encoders for table motion



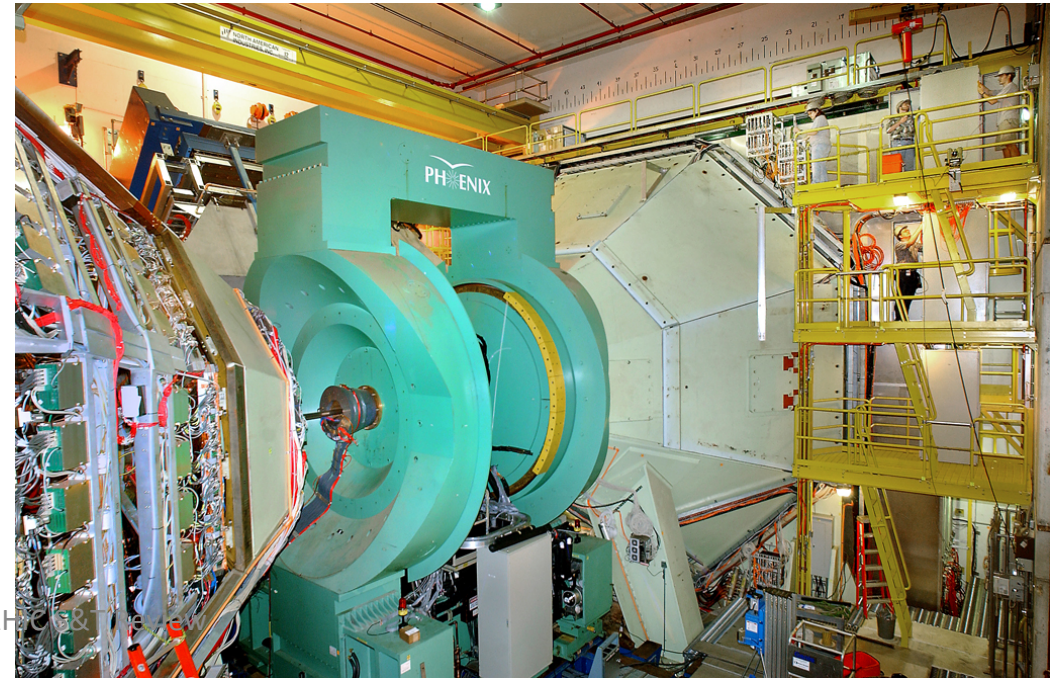


PHENIX Removal and Repurposing Scope

The PHENIX detector located in Building 1008 in the RHIC complex will be removed at the end of the RHIC 2016 run in June 2016. Activities will result in the removal of the PHENIX detector from the Interaction Region (IR), capping off of IR utilities and services, and conditioning of the area for the eventual installation of a new detector at RHIC. Equipment and materials from the PHENIX detector will, as appropriate, be collected and preserved for re-use for the major upgrade of PHENIX, **sPHENIX**, returned to the institutions owning the items, stored for reuse in other projects, or properly disposed of. Removal of other specific equipment and materials will also take place in the PHENIX Assembly Hall, Power Supply Building, Pump House, Gas Mixing Hut and Gas Pad. No removal activities are anticipated for the 1008 Counting House, or Control Room where the equipment will be preserved for re-use in a future RHIC detector to be installed in 1008.

All disposition of equipment from the PHENIX detector will be coordinated through the BNL Department of Procurement and Property Management in consultation with The Brookhaven Site Office (BSHO) and the Department of Energy Office of Nuclear Physics (DOE-ONP). All removal and repurposing activities will be planned using the BNL Subject-Based Management System (SBMS) for Work-Planning and Safety guidelines. Any activities requiring reviews beyond the normal Work-Planning process, for example particular rigging operations or jobs involving working at heights, will be reviewed by the appropriate Collider Accelerator Department (C-AD) or BNL Safety Committee. All waste materials shall be properly disposed of as per BNL requirements. All items to be removed from the IR will be handled in accordance with the SBMS Hazard Analysis Plan and screened for possible radiological activation. A preliminary assessment has been made of the amount and type of potentially activated materials and is factored into the cost estimates. Material screening will verify the preliminary assessment.

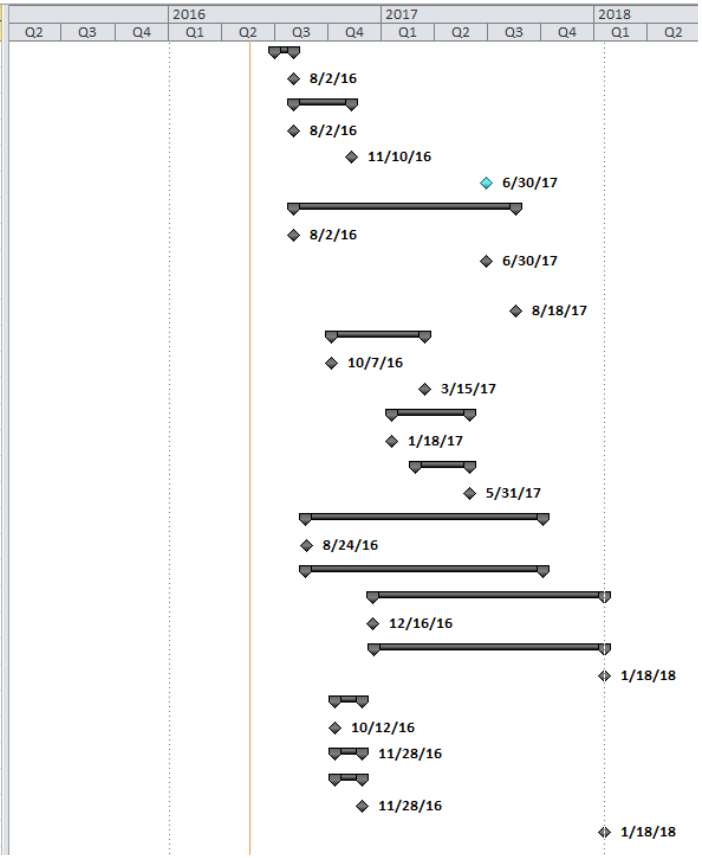
At the end of the PHENIX Removal, the 1008 Interaction Region, Assembly Hall, Power Supply Building, Pump House, and sections of the Gas Mixing Hut and Gas Pad will be clear of all PHENIX equipment and materials that are unneeded for a future upgrade of PHENIX.



R&R Schedule Overview and Milestones

The PHENIX R&R is on schedule. A work plan exists with a resource-loaded schedule. We've development R&R work packages that has been approved by CAD Safety. Work will continue until January 2018 for a total duration of 1.5 years.

WBS	Task Name	Start
3.3	Initial Tasks to prep for Equipment removal after run 16	Fri 7/1/16
3.3.11	Initial Tasks Completed	Tue 8/2/16
3.4	Dismantle East Carriage (EC)	Tue 8/2/16
3.4.1	Begin EC Removal and Repurposing	Tue 8/2/16
3.4.10	EC Removal Complete	Thu 11/10/16
3.5	End of Run 17	Fri 6/30/17
3.6	Remove and Preserve Beampipe (BP)	Tue 8/2/16
3.6.1	Begin Beampipe removal/Preservation	Tue 8/2/16
3.6.12	Remove North 3 to 5 transition BP spool, cover flanges with Aluminum foil and move to safe storage	Fri 6/30/17
3.6.14	Beampipe removed and Preserved	Fri 8/18/17
3.7	Dismantle Muon Magnet South (MMS)	Fri 10/7/16
3.7.1	Begin MMS Removal and Repurposing	Fri 10/7/16
3.7.10	MMS Removal Complete	Wed 3/15/17
3.8	Dismantle Central Magnet (CM)	Wed 1/18/17
3.8.1	Begin CM Removal	Wed 1/18/17
3.8.7	CM - Structural disassembly	Tue 2/28/17
3.8.7.5	CM Removal Complete	Wed 5/31/17
3.9	Dismantle West Carriage (WC)	Wed 8/24/16
3.9.1	Begin WC Removal	Wed 8/24/16
3.9.10	WC - Carriage structural disassembly	Wed 8/24/16
3.10	Dismantle Muon Magnet North (MMN)	Fri 12/16/16
3.10.1	Begin MMN Removal	Fri 12/16/16
3.10.7	MMN - Structural disassembly	Mon 12/19/16
3.10.7.6	MMN Removal Complete	Thu 1/18/18
3.11	Remova and Repurpose Interaction Region (IR) and Non-IR Support Structures	Wed 10/12/16
3.11.1	Begin IR and Non -IR Support Structures Removal and Repurposing	Wed 10/12/16
3.11.2	Dismantle IR Support Structures	Thu 10/13/16
3.11.3	Non-IR PHENIX removal	Thu 10/13/16
3.11.3.3	Miscellaneous Removal Complete	Mon 11/28/16
4	Removal and Repurposing Complete	Thu 1/18/18



PHENIX R&R Approach

A unique aspect of the PHENIX R&R is that the technical crew that will be disassembling PHENIX are for the most part the same people that built, operated and maintained PHENIX over the last 20 years.

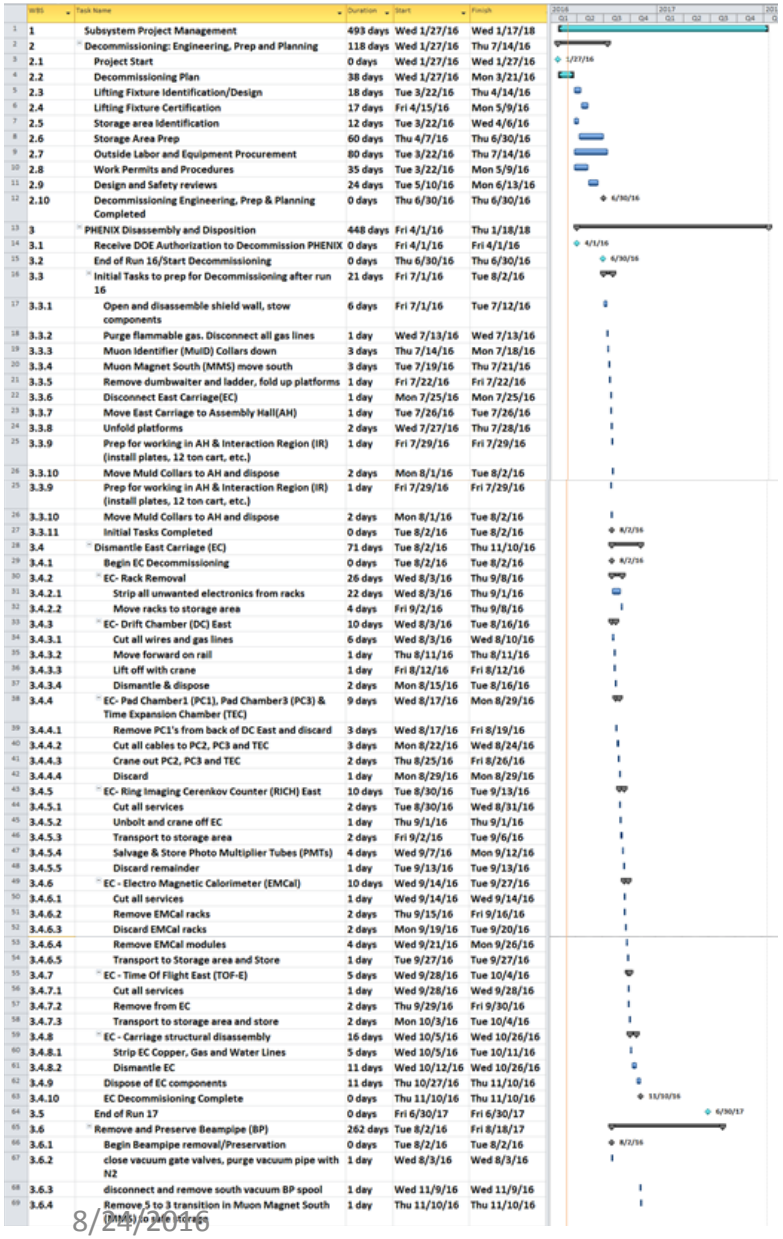
In addition the CAD personnel supplementing the R&R work force also have long experience maintaining the equipment in 1008 - The CAD Experimental Equipment and Facility Support group.

Outside contractors will be needed for specific rigging and flame cutting work starting approximately 1 year from now. They will be closely supervised by the PHENIX R&R team

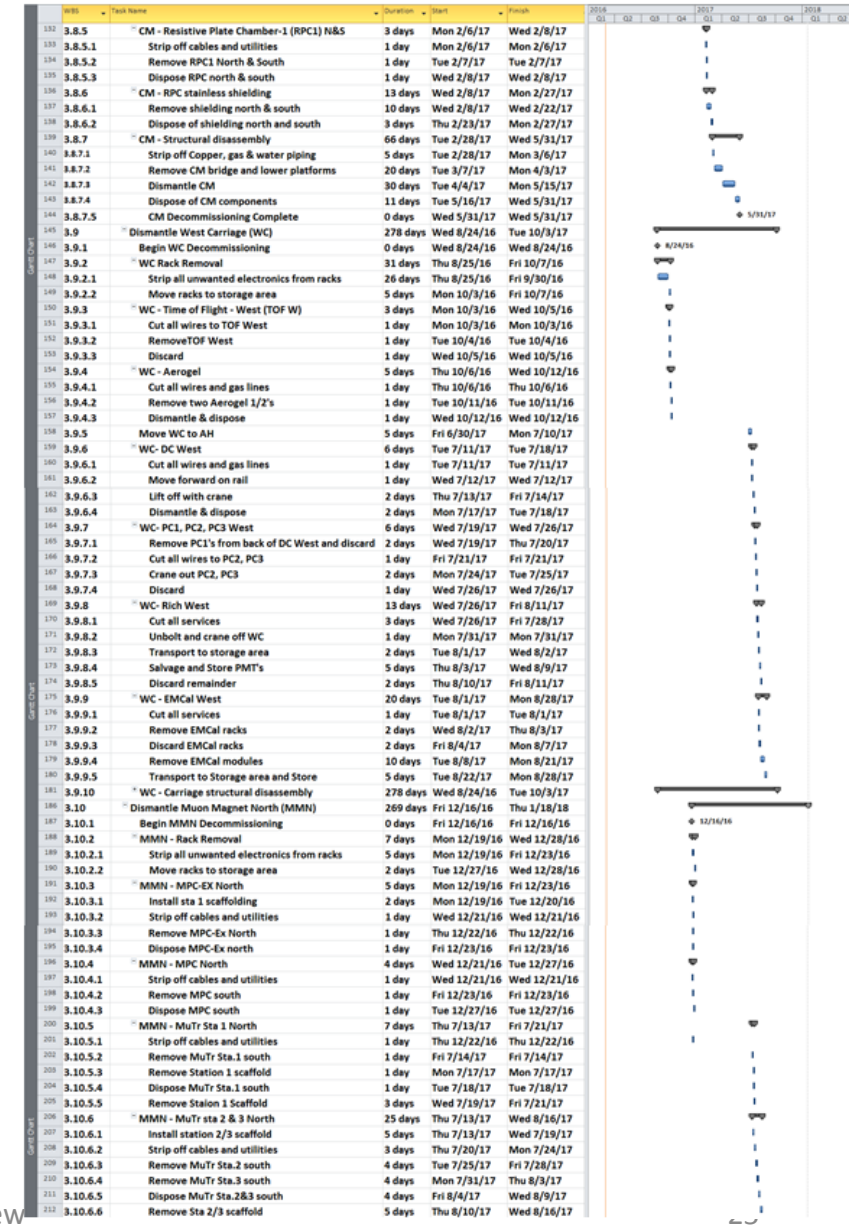
We have an outstanding safety record in 1008. We work very closely with the CAD Safety group led by Ed Lessard, who are recognized as very capable safety experts with an exemplary safety record.

Meet weekly with CAD safety and BHSO rep on R&R progress. Meet with BNL Property Management ~ once/month. Made R&R status presentations to BHSO three times in last six months. Made R&R report to BNL Directorate.

Resource-loaded Project File



WBS	Task Name	Duration	Start	Finish
1	Subsystem Project Management	493 days	Wed 1/27/16	Wed 1/17/18
2	Decommissioning: Engineering, Prep and Planning	118 days	Wed 1/27/16	Thu 7/14/16
2.1	Project Start	0 days	Wed 1/27/16	Wed 1/27/16
2.2	Decommissioning Plan	38 days	Wed 1/27/16	Mon 3/21/16
2.3	Lifting Fixture Identification/Design	18 days	Tue 3/22/16	Thu 4/14/16
2.4	Lifting Fixture Certification	17 days	Fri 4/15/16	Mon 5/9/16
2.5	Storage area Identification	12 days	Tue 3/22/16	Wed 4/6/16
2.6	Storage Area Prep	60 days	Thu 4/7/16	Thu 6/30/16
2.7	Outside Labor and Equipment Procurement	80 days	Tue 3/22/16	Thu 7/14/16
2.8	Work Permits and Procedures	35 days	Tue 3/22/16	Mon 5/9/16
2.9	Design and Safety reviews	24 days	Tue 5/10/16	Mon 6/13/16
2.10	Decommissioning Engineering, Prep & Planning Completed	0 days	Thu 6/30/16	Thu 6/30/16
3	PHENIX Disassembly and Disposition	448 days	Fri 4/1/16	Thu 1/18/18
3.1	Receive DOE Authorization to Decommission PHENIX	0 days	Fri 4/1/16	Fri 4/1/16
3.2	End of Run 16/Start Decommissioning	0 days	Thu 6/30/16	Thu 6/30/16
3.3	Initial Tasks to prep for Decommissioning after run 16	21 days	Fri 7/1/16	Tue 8/2/16
3.3.1	Open and disassemble shield wall, stow components	6 days	Fri 7/1/16	Tue 7/12/16
3.3.2	Purge flammable gas. Disconnect all gas lines	1 day	Wed 7/13/16	Wed 7/13/16
3.3.3	Muon Identifier (MuID) Collars down	3 days	Thu 7/14/16	Mon 7/18/16
3.3.4	Muon Magnet South (MMS) move south	3 days	Tue 7/19/16	Thu 7/21/16
3.3.5	Remove dumbwaiter and ladder, fold up platforms	1 day	Fri 7/22/16	Fri 7/22/16
3.3.6	Disconnect East Carriage(EC)	1 day	Mon 7/25/16	Mon 7/25/16
3.3.7	Move East Carriage to Assembly Hall(AH)	1 day	Tue 7/26/16	Tue 7/26/16
3.3.8	Unfold platforms	2 days	Wed 7/27/16	Thu 7/28/16
3.3.9	Prep for working in AH & Interaction Region (IR) (install plates, 12 ton cart, etc.)	1 day	Fri 7/29/16	Fri 7/29/16
3.3.10	Move Muld Collars to AH and dispose	2 days	Mon 8/1/16	Tue 8/2/16
3.3.9	Prep for working in AH & Interaction Region (IR) (install plates, 12 ton cart, etc.)	1 day	Fri 7/29/16	Fri 7/29/16
3.3.10	Move Muld Collars to AH and dispose	2 days	Mon 8/1/16	Tue 8/2/16
3.3.11	Initial Tasks Completed	0 days	Tue 8/2/16	Tue 8/2/16
3.4	Dismantle East Carriage (EC)	71 days	Tue 8/2/16	Thu 11/10/16
3.4.1	Begin EC Decommissioning	0 days	Tue 8/2/16	Tue 8/2/16
3.4.2	EC- Rack Removal	26 days	Wed 8/3/16	Thu 9/8/16
3.4.2.1	Strip all unwanted electronics from racks	22 days	Wed 8/3/16	Thu 9/1/16
3.4.2.2	Move racks to storage area	4 days	Fri 9/2/16	Thu 9/8/16
3.4.3	EC- Drift Chamber (DC) East	10 days	Wed 8/3/16	Tue 8/16/16
3.4.3.1	Cut all wires and gas lines	6 days	Wed 8/3/16	Wed 8/10/16
3.4.3.2	Move forward on rail	1 day	Thu 8/11/16	Thu 8/11/16
3.4.3.3	Lift off with crane	1 day	Fri 8/12/16	Fri 8/12/16
3.4.3.4	Dismantle & dispose	2 days	Mon 8/15/16	Tue 8/16/16
3.4.4	EC- Pad Chamber1 (PC1), Pad Chamber3 (PC3) & Time Expansion Chamber (TEC)	9 days	Wed 8/17/16	Mon 8/29/16
3.4.4.1	Remove PC1's from back of DC East and discard	3 days	Wed 8/17/16	Fri 8/19/16
3.4.4.2	Cut all cables to PC2, PC3 and TEC	3 days	Mon 8/22/16	Wed 8/24/16
3.4.4.3	Crane out PC2, PC3 and TEC	2 days	Thu 8/25/16	Fri 8/26/16
3.4.4.4	Discard	1 day	Mon 8/29/16	Mon 8/29/16
3.4.5	EC- Ring Imaging Cerenkov Counter (RICH) East	10 days	Tue 8/30/16	Tue 9/13/16
3.4.5.1	Cut all services	2 days	Tue 8/30/16	Wed 8/31/16
3.4.5.2	Unbolt and crane off EC	1 day	Thu 9/1/16	Thu 9/1/16
3.4.5.3	Transport to storage area	2 days	Fri 9/2/16	Tue 9/6/16
3.4.5.4	Salvage & Store Photo Multiplier Tubes (PMTs)	4 days	Wed 9/7/16	Mon 9/12/16
3.4.5.5	Discard remainder	1 day	Tue 9/13/16	Tue 9/13/16
3.4.6	EC - Electro Magnetic Calorimeter (EMCal)	10 days	Wed 9/14/16	Tue 9/27/16
3.4.6.1	Cut all services	1 day	Wed 9/14/16	Wed 9/14/16
3.4.6.2	Remove EMCal racks	2 days	Thu 9/15/16	Fri 9/16/16
3.4.6.3	Discard EMCal racks	2 days	Mon 9/19/16	Tue 9/20/16
3.4.6.4	Remove EMCal modules	4 days	Wed 9/21/16	Mon 9/26/16
3.4.6.5	Transport to Storage area and Store	1 day	Tue 9/27/16	Tue 9/27/16
3.4.7	EC - Time Of Flight East (TOF-E)	5 days	Wed 9/28/16	Tue 10/4/16
3.4.7.1	Cut all services	1 day	Wed 9/28/16	Wed 9/28/16
3.4.7.2	Remove from EC	2 days	Thu 9/29/16	Fri 9/30/16
3.4.7.3	Transport to storage area and store	2 days	Mon 10/3/16	Tue 10/4/16
3.4.8	EC - Carriage structural disassembly	16 days	Wed 10/5/16	Wed 10/26/16
3.4.8.1	Strip EC Copper, Gas and Water Lines	5 days	Wed 10/5/16	Tue 10/11/16
3.4.8.2	Dismantle EC	11 days	Wed 10/12/16	Wed 10/26/16
3.4.9	Dispose of EC components	11 days	Thu 10/27/16	Thu 11/10/16
3.4.10	EC Decommisioning Complete	0 days	Thu 11/10/16	Thu 11/10/16
3.5	End of Run 17	0 days	Fri 6/30/17	Fri 6/30/17
3.6	Remove and Preserve Beampipe (BP)	262 days	Tue 8/2/16	Fri 8/18/17
3.6.1	Begin Beampipe removal/Preservation	0 days	Tue 8/2/16	Tue 8/2/16
3.6.2	close vacuum gate valves, purge vacuum pipe with N2	1 day	Wed 8/3/16	Wed 8/3/16
3.6.3	disconnect and remove south vacuum BP spool	1 day	Wed 11/9/16	Wed 11/9/16
3.6.4	Remove 5 to 3 transition in Muon Magnet South (MMS) to store storage	1 day	Thu 11/10/16	Thu 11/10/16



WBS	Task Name	Duration	Start	Finish
3.8.5	CM - Resistive Plate Chamber-1 (RPC1) N&S	3 days	Mon 2/6/17	Wed 2/8/17
3.8.5.1	Strip off cables and utilities	1 day	Mon 2/6/17	Mon 2/6/17
3.8.5.2	Remove RPC1 North & South	1 day	Tue 2/7/17	Tue 2/7/17
3.8.5.3	Dispose RPC north & south	1 day	Wed 2/8/17	Wed 2/8/17
3.8.6	CM - RPC stainless shielding	13 days	Wed 2/8/17	Mon 2/27/17
3.8.6.1	Remove shielding north & south	10 days	Wed 2/8/17	Wed 2/22/17
3.8.6.2	Dispose of shielding north and south	3 days	Thu 2/23/17	Mon 2/27/17
3.8.7	CM - Structural disassembly	66 days	Tue 2/28/17	Wed 5/31/17
3.8.7.1	Strip off Copper, gas & water piping	5 days	Tue 2/28/17	Mon 3/6/17
3.8.7.2	Remove CM bridge and lower platforms	20 days	Tue 3/7/17	Mon 4/3/17
3.8.7.3	Dismantle CM	30 days	Tue 4/4/17	Mon 5/15/17
3.8.7.4	Dispose of CM components	11 days	Tue 5/16/17	Wed 5/31/17
3.8.7.5	CM Decommissioning Complete	0 days	Wed 5/31/17	Wed 5/31/17
3.9	Dismantle West Carriage (WC)	278 days	Wed 8/24/16	Tue 10/3/17
3.9.1	Begin WC Decommissioning	0 days	Wed 8/24/16	Wed 8/24/16
3.9.2	WC Rack Removal	31 days	Thu 8/25/16	Fri 10/7/16
3.9.2.1	Strip all unwanted electronics from racks	26 days	Thu 8/25/16	Fri 9/30/16
3.9.2.2	Move racks to storage area	5 days	Mon 10/3/16	Fri 10/7/16
3.9.3	WC - Time of Flight - West (TOF W)	3 days	Mon 10/3/16	Wed 10/5/16
3.9.3.1	Cut all wires to TOF West	1 day	Mon 10/3/16	Mon 10/3/16
3.9.3.2	RemoveTOF West	1 day	Tue 10/4/16	Tue 10/4/16
3.9.3.3	Discard	1 day	Wed 10/5/16	Wed 10/5/16
3.9.4	WC - Aerogel	5 days	Thu 10/6/16	Wed 10/12/16
3.9.4.1	Cut all wires and gas lines	1 day	Thu 10/6/16	Thu 10/6/16
3.9.4.2	Remove two Aerogel 1/2's	1 day	Tue 10/11/16	Tue 10/11/16
3.9.4.3	Dismantle & dispose	1 day	Wed 10/12/16	Wed 10/12/16
3.9.5	Move WC to AH	5 days	Fri 6/30/17	Mon 7/10/17
3.9.6	WC- DC West	6 days	Tue 7/11/17	Tue 7/18/17
3.9.6.1	Cut all wires and gas lines	1 day	Tue 7/11/17	Tue 7/11/17
3.9.6.2	Move forward on rail	1 day	Wed 7/12/17	Wed 7/12/17
3.9.6.3	Lift off with crane	2 days	Thu 7/13/17	Fri 7/14/17
3.9.6.4	Dismantle & dispose	2 days	Mon 7/17/17	Tue 7/18/17
3.9.7	WC- PC1, PC2, PC3 West	6 days	Wed 7/19/17	Wed 7/26/17
3.9.7.1	Remove PC1's from back of DC West and discard	2 days	Wed 7/19/17	Thu 7/20/17
3.9.7.2	Cut all wires to PC2, PC3	1 day	Fri 7/21/17	Fri 7/21/17
3.9.7.3	Crane out PC2, PC3	2 days	Mon 7/24/17	Tue 7/25/17
3.9.7.4	Discard	1 day	Wed 7/26/17	Wed 7/26/17
3.9.8	WC- Rich West	13 days	Wed 7/26/17	Fri 8/11/17
3.9.8.1	Cut all services	3 days	Wed 7/26/17	Fri 7/28/17
3.9.8.2	Unbolt and crane off WC	1 day	Mon 7/31/17	Mon 7/31/17
3.9.8.3	Transport to storage area	2 days	Tue 8/1/17	Wed 8/2/17
3.9.8.4	Salvage and Store PMT's	5 days	Thu 8/3/17	Wed 8/9/17
3.9.8.5	Discard remainder	2 days	Thu 8/10/17	Fri 8/11/17
3.9.9	WC - EMCal West	20 days	Tue 8/1/17	Mon 8/28/17
3.9.9.1	Cut all services	1 day	Tue 8/1/17	Tue 8/1/17
3.9.9.2	Remove EMCal racks	2 days	Wed 8/2/17	Thu 8/3/17
3.9.9.3	Discard EMCal racks	2 days	Fri 8/4/17	Mon 8/7/17
3.9.9.4	Remove EMCal modules	10 days	Tue 8/8/17	Mon 8/21/17
3.9.9.5	Transport to Storage area and Store	5 days	Tue 8/22/17	Mon 8/28/17
3.9.10	WC - Carriage structural disassembly	278 days	Wed 8/24/16	Tue 10/3/17
3.10	Dismantle Muon Magnet North (MMN)	269 days	Fri 12/16/16	Thu 1/18/18
3.10.1	Begin MMN Decommissioning	0 days	Fri 12/16/16	Fri 12/16/16
3.10.2	MMN - Rack Removal	7 days	Mon 12/19/16	Wed 12/28/16
3.10.2.1	Strip all unwanted electronics from racks	5 days	Mon 12/19/16	Fri 12/23/16
3.10.2.2	Move racks to storage area	2 days	Tue 12/27/16	Wed 12/28/16
3.10.3	MMN - MPC-EX North	5 days	Mon 12/19/16	Fri 12/23/16
3.10.3.1	Install sta 1 scaffolding	2 days	Mon 12/19/16	Tue 12/20/16
3.10.3.2	Strip off cables and utilities	1 day	Wed 12/21/16	Wed 12/21/16
3.10.3.3	Remove MPC-Ex North	1 day	Thu 12/22/16	Thu 12/22/16
3.10.3.4	Dispose MPC-Ex north	1 day	Fri 12/23/16	Fri 12/23/16
3.10.4	MMN - MPC North	4 days	Wed 12/21/16	Tue 12/27/16
3.10.4.1	Strip off cables and utilities	1 day	Wed 12/21/16	Wed 12/21/16
3.10.4.2	Remove MPC south	1 day	Fri 12/23/16	Fri 12/23/16
3.10.4.3	Dispose MPC south	1 day	Tue 12/27/16	Tue 12/27/16
3.10.5	MMN - MuTr Sta 1 North	7 days	Thu 7/13/17	Fri 7/21/17
3.10.5.1	Strip off cables and utilities	1 day	Thu 12/22/16	Thu 12/22/16
3.10.5.2	Remove MuTr Sta.1 south	1 day	Fri 7/14/17	Fri 7/14/17
3.10.5.3	Remove Station 1 scaffold	1 day	Mon 7/17/17	Mon 7/17/17
3.10.5.4	Dispose MuTr Sta.1 south	1 day	Tue 7/18/17	Tue 7/18/17
3.10.5.5	Remove Staion 1 Scaffold	3 days	Wed 7/19/17	Fri 7/21/17
3.10.6	MMN - MuTr sta 2 & 3 North	25 days	Thu 7/13/17	Wed 8/16/17
3.10.6.1	Install station 2/3 scaffold	5 days	Thu 7/13/17	Wed 7/19/17
3.10.6.2	Strip off cables and utilities	3 days	Thu 7/20/17	Mon 7/24/17
3.10.6.3	Remove MuTr Sta.2 south	4 days	Tue 7/25/17	Fri 7/28/17
3.10.6.4	Remove MuTr Sta.3 south	4 days	Mon 7/31/17	Thu 8/3/17
3.10.6.5	Dispose MuTr Sta.2&3 south	4 days	Fri 8/4/17	Wed 8/9/17
3.10.6.6	Remove Sta 2/3 scaffold	5 days	Thu 8/10/17	Wed 8/16/17

Tagged Property in 1008

Row Labels	Acq CODE	DESCRIPTION	SECONDARY DESC	Asset ID	Blg.	Room	RESPONSIBLE	Sum of AMOUNT
AD	Capital	Crane	15 TON OVERHEAD CRANE	124020	1008	RING	PHILLIPS,DAVID	$55,555
				124023	1008	RING	PHILLIPS,DAVID	$55,554
		Safety Equipment	Safety Platform Stairs	121556	1008	RING	PHILLIPS,DAVID	$135,416
PO	Capital	Detector Particle	CENTRAL MAGNET	101650	1008	RING	O'BRIEN,EDWARD	$1,136,636
			PAD CHAMBER	116468	1008	RING	O'BRIEN,EDWARD	$177,005
			PHOENIX DETECTOR	116442	1008	RING	O'BRIEN,EDWARD	$31,421,095
Grand Total								$32,981,262

Row Labels	CAT	Count of Asset_ID	Sum of AMOUNT
AD	311	3	4,014.62
	Desktop Personal Computer	3	4,014.62
	312	23	331,093.34
	Exper Control System	1	14,025.00
	Pump Vacuum	1	14,007.75
	Pwr Supply To 750V	19	269,810.59
	Vacuum Pump System	2	33,250.00
	425	1	5,521.88
	Pump Metering	1	5,521.88
	460	5	381,695.08
	Air Conditioner	2	135,169.98
	Crane	2	111,109.00
	Safety Equipment	1	135,416.10
PO	311	42	44,690.08
	Camera Genl Purpose	2	502.11
	Desktop Personal Computer	37	39,236.28
	Laptop Personal Computer	3	4,951.69
	312	22	421,331.41
	Control Unit Pwr Sup	3	42,255.00
	Desktop Personal Computer	9	45,068.86
	Large Disk Drives	5	58,160.00
	Network Servers	1	12,231.55
	Other Storage Units	1	10,062.00
	Pc Network System	1	203,064.00
	Standard Volt Source	2	50,490.00
	340	2	68,400.00
	Analyzer Gas	1	52,400.00
	Truck Lift	1	16,000.00
	425	10	33,117,294.64
	Analyzer Component	1	8,475.00
	Analyzer Logic	1	27,870.44
	Detector Particle	3	32,734,736.54
	Dewar	1	65,884.34
	Laser	1	35,660.62
	Oscilloscope	2	93,728.02
	Pwr Supply To 750V	1	150,939.68
	440	12	2,302,105.14
	Computer	1	1,347,214.09
	Large Disk Drives	1	11,115.00
	Network Servers	10	943,776.05
SI	312	2	37,266.82
	Lift Fork	1	16,381.00
	Low Speed Vehicle	1	20,885.82
	420	1	56,736.00
	Trailer	1	56,736.00
Grand Total		123	36,770,149.01

There is an additional ~$43M in value for the original PHENIX detector assigned to the RHIC facility

Major PHENIX Removal Tasks

The major activities associated with the PHENIX Removal include:

- Removal of the PHENIX East Carriage (EC) and associated equipment.
- Removal and preservation of the PHENIX beryllium beam pipe for reuse by sPHENIX.
- Removal of the PHENIX Muon Magnet South (MMS) Spectrometer and associated equipment.
- Removal of the PHENIX Central Magnet (CM) and associated equipment.
- Removal of the PHENIX West Carriage (WC) and associated equipment
- Removal of the PHENIX Muon Magnet North (MMN) Spectrometer and associated equipment.
- Capping of utilities and services (power, water, safety, gas) and preserving them in a state for reuse by a future experiment.
- Installation of a replacement beam pipe in 1008 to allow RHIC to operate until the start of installation of a new experiment in 2020.
- Removal of particular equipment and materials from the 1008 Assembly Hall, Gas Mixing Hut, Power Supply Building, Pump House, and Gas Pad that is not needed for future experiments at 1008.
- Restoration of the 1008 facilities to a state that enables the preparation for and installation of a future experiment.

Tim Hallman's slide from RHIC Users Meeting June 9